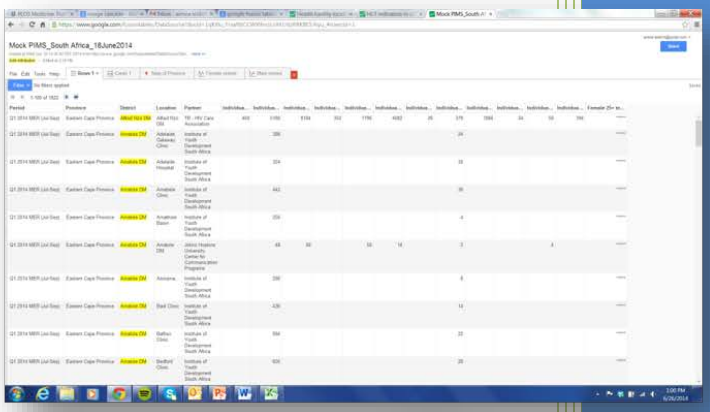
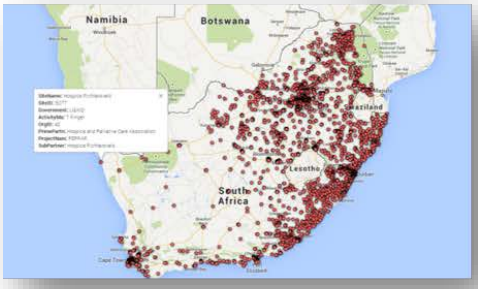
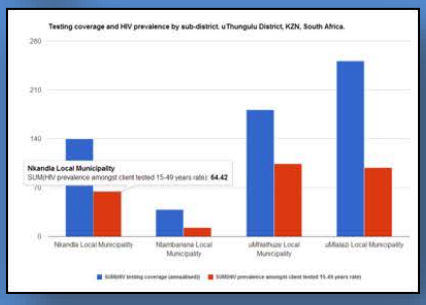
UCSF Global Health Sciences
Global Strategic Information

Google FusionTables for Global Health
User Manual






Testing coverage and HIV prevalence by sub-district, uThungulu District, KZN, South Africa.
Nkandla Local Municipality
Nkandla Local Municipality
Ntambanana Local Municipality
uMhlathuze Local Municipality
uMlalazi Local Municipality

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1. Introduction

This manual offers a systematic approach to using Google FusionTables as a tool for informing evidence-based strategic planning. Google FusionTables is a web-based, interactive worksheet that provides a powerful tool for summarizing large amounts of tabular data by:

i. Calculating totals, averages, medians, and counts based on source data
ii. Classifying data based on other fields in the source data
iii. Auto-generating charts
iv. Overlaying data on Google Maps

Use Requirements

To use Google Fusion Tables, users will need basic operational knowledge of the computer, the internet and Microsoft Office Excel. Before starting this manual users need a Google account (also known as a Gmail account), access to the internet using the Chrome internet browser and access to the Google FusionTables application.

- Create a free Google account: https://accounts.google.com/SignUp
- Download Chrome: https://www.google.com/chrome/browser/
- Google FusionTables: https://www.google.com/fusiontables/

To demonstrate how to use this tool, we will follow an example using publically available ANC Sentinel Surveillance data from Mpumalanga Province in South Africa. These datasets can be downloaded here:

- Health facility level data: http://bit.ly/1tgWN0H
- District level data: http://bit.ly/1yVI2BB

Video Tutorials

Online video tutorials accompany each section of this manual. Select the link below to watch all videos as a series or select the video tutorial links within each section of this manual to view specific topics.

- Google Fusion Tables for Global Health Playlist: http://www.youtube.com/playlist?list=PLJJGPn3_vrpDueYPUBwTwrKhOIgVsy-Oy

2. Preparing data for use in FusionTables

2.1. Data Inputs

Video tutorial: https://www.youtube.com/watch?v=gZi9xh4L9GM

Data to be used in Google FusionTables must first be in a Microsoft Excel spreadsheet or Google Spreadsheet formatted with specific information in the rows (individual records displayed horizontally), columns (variables or indicators displayed vertically), and data items (contents within rows and columns) of the spreadsheet.

1. Enter data into Excel using the following format:

Column A: Geographic indicator (Province, district, sub-district, facility).

Columns B and above: Indicators or variables

Row 1: Column Headers. Column headers should contain all components necessary to describe the data such as "*HIV Prevalence Females All Ages ANC 2010.*"At a minimum, the following should be included in the column header:

1. Indicator name (*e.g. HIV Prevalence*);
2. Sex (*e.g.Female*)
3. Age aggregation (*e.g.All ages, 15-24*);
4. Source and year *(e.g. ANC 2010)*

Tip: Each spreadsheet should contain data from only one geographic disaggregation. If you wish to work with more than one geographic aggregation, such as province level data in addition to district level data, create separate spreadsheets for each.

Rows 2 and above: Data elements/values

	A	B	C	D	E	F
1	**District**	**HIV Prevalence Females All Ages ANC 2010**	**HIV Prevalence Females All Ages ANC 2011**	**HIV Prevalence Females All Ages ANC 2012**	**No. tested positive for HIV Females All Ages MOCK DATA**	**No. tested for HIV Females All Ages MOCK DATA**
2	Ehlanzeni	37.7	35.8	35.1	335726	699429
3	Gert Sibande	38.8	46.1	40.5	118702	211967
4	Nkangala	27.2	29.6	32.1	199879	444175
5						

2. Save your file with a name and location that is easy to remember. For example, a file containing ANC Surveillance HIV prevalence data from Mpumalanga province in South Africa may be called "ANC HIV Prevalence Mpumalanga 2010-2012" and saved to your desktop.

2.2. *Importing data into Google FusionTables*

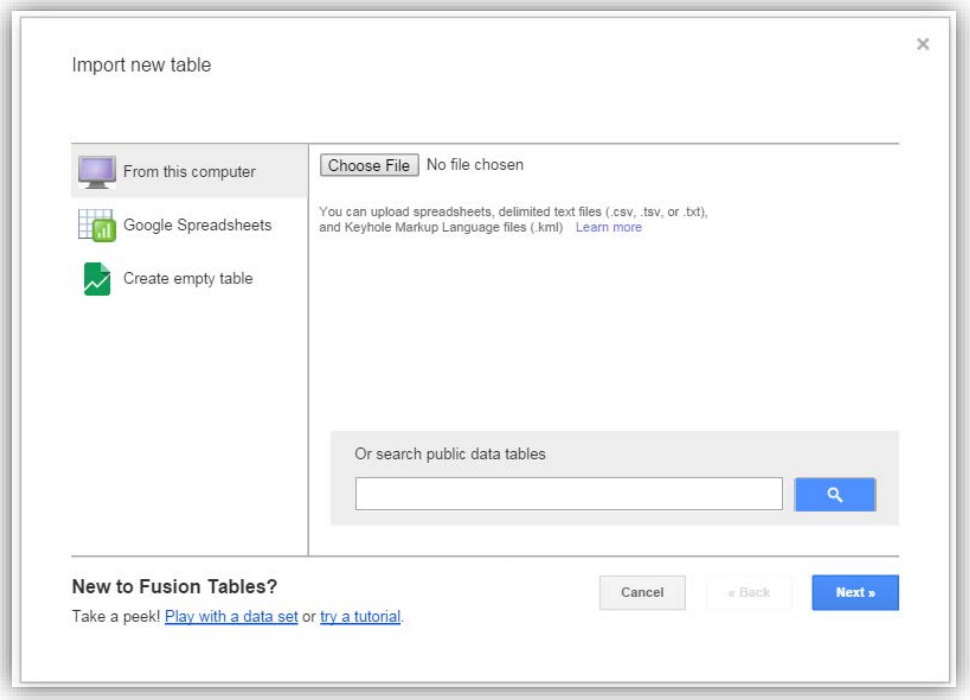
Video tutorial: https://www.youtube.com/watch?v=h1zT7KV-BoY

To import data into Google Fusion Table, execute the following steps:

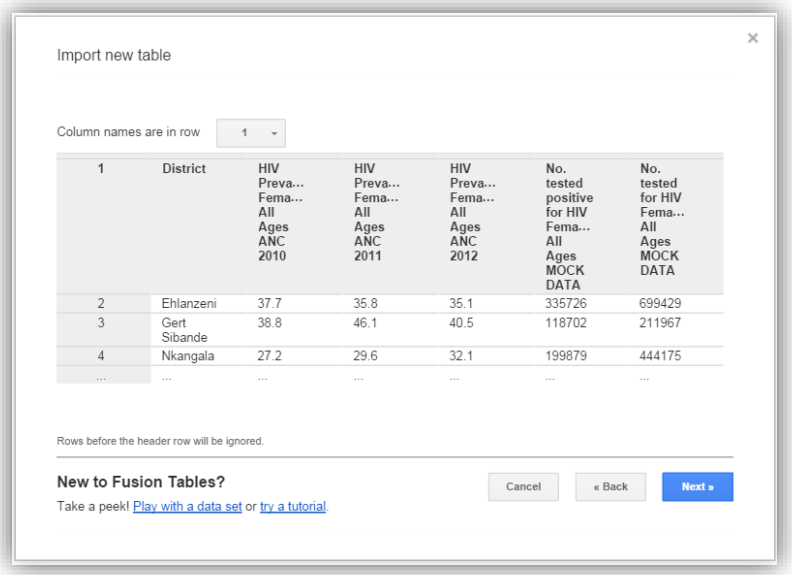
1. Visit https://www.google.com/fusiontables/
2. Select 'Create a Fusion Table'

Tip: You must be logged into your Google or Gmail account prior to working in Google FusionTables.

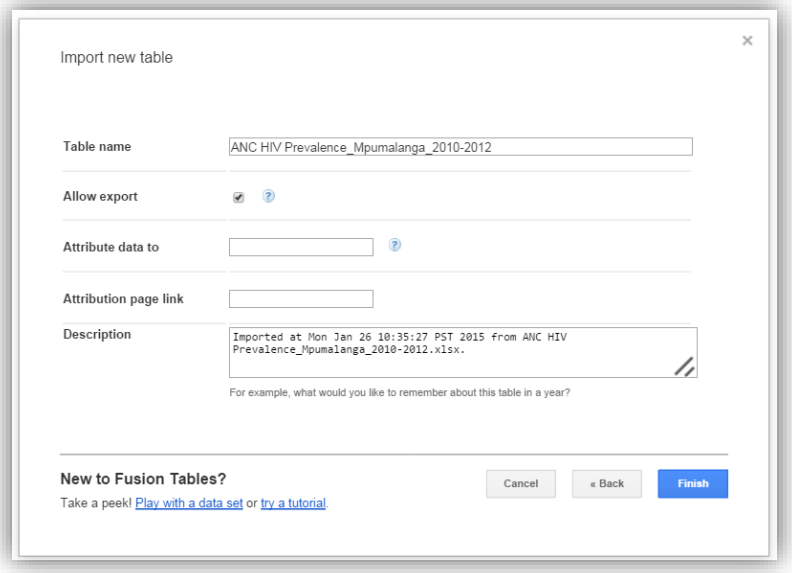
The 'Import new table' dialog box appears.


Import new table
From this computer
Google Spreadsheets
Create empty table
Choose File
No file chosen
You can upload spreadsheets, delimited text files (.csv, .tsv, or .txt), and Keyhole Markup Language files (.kml) Learn more
Or search public data tables
New to Fusion Tables?
Take a peek! Play with a data set or try a tutorial.
Cancel
« Back
Next »

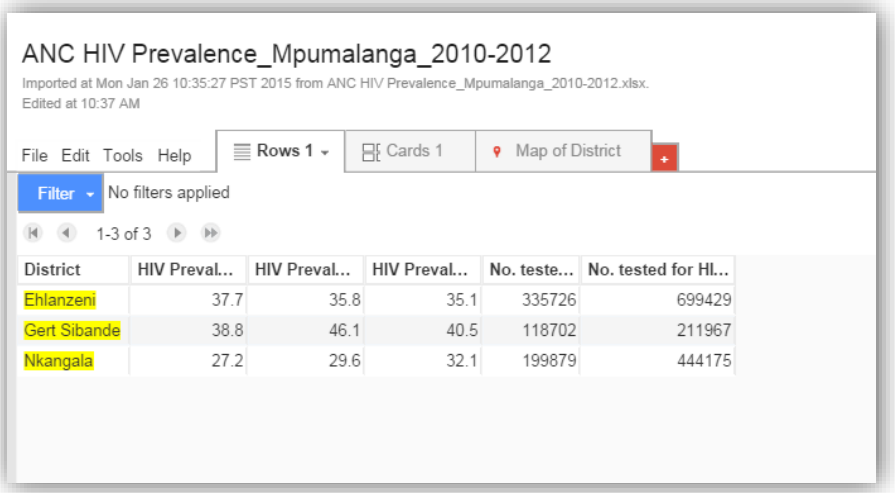
3. Select From this computer
4. Browse to find the Excel data file you wish to import (e.g., ANC HIV Prevalence_Mpumalanga_2010-2012)
5. The spreadsheet should appear. Select 'Next'


Import new table
Column names are in row 1
1 District HIV Preva... Fema... All Ages ANC 2010 HIV Preva... Fema... All Ages ANC 2011 HIV Preva... Fema... All Ages ANC 2012 No. tested positive for HIV Fema... All Ages MOCK DATA No. tested for HIV Fema... All Ages MOCK DATA
2 Ehlanzeni 37.7 35.8 35.1 335726 699429
3 Gert Sibande 38.8 46.1 40.5 118702 211967
4 Nkangala 27.2 29.6 32.1 199879 444175
Rows before the header row will be ignored.
New to Fusion Tables?
Take a peek! Play with a data set or try a tutorial.
Cancel
« Back
Next »

6. Name your table under Table Name and write a description. Select 'Next'


Import new table
Table name
ANC HIV Prevalence_Mpumalanga_2010-2012
Allow export
Attribute data to
Attribution page link
Description
Imported at Mon Jan 26 10:35:27 PST 2015 from ANC HIV Prevalence_Mpumalanga_2010-2012.xlsx.
For example, what would you like to remember about this table in a year?
New to Fusion Tables?
Take a peek! Play with a data set or try a tutorial.
Cancel
« Back
Finish

Your dataset will appear in the Google Fusion Table application. Repeat this step as necessary until all files to be used in Google FusionTables have been imported (e.g., KML Files, other datasets).



2.3. *Calculating Formulas*

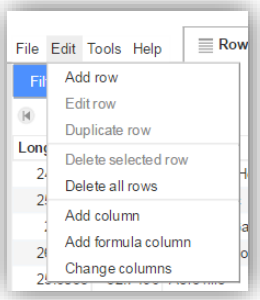
Video tutorial: https://www.youtube.com/watch?v=iyTeC8qNFWo

Formulas can be created by adding an additional indicator that calculates a formula using data from indicators already in your dataset or other values. For example if we wish to calculate the HIV testing yield from our data, we will write the following formula:

'number tested positive for HIV'/'number tested for HIV'

To do this, execute the following steps:

1. Select 'Edit' from the menu
2. Select 'Add' formula column



> **Tip**: If you are working in a merged file, you will not be able to Add formula column. See *Downloading a dataset* for information on how to download and import a merged FusionTable to regain full function.

3. Enter a name for your new indicator (e.g. *HIV Testing Yield*).

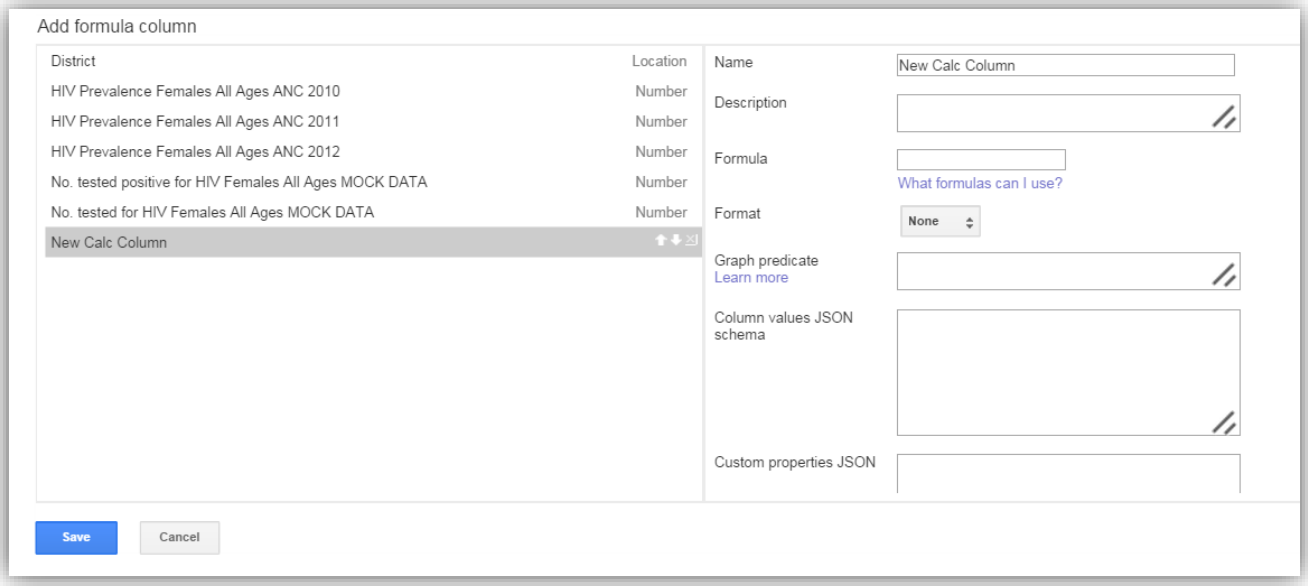
4. Enter a description of this new indicator, if applicable
5. Enter the formula to be calculated.

Tip: Formulas should be formatted similar to Excel. They can include pre-existing indicators from your dataset and/or other values. See this link for more information on creating formulas in FusionTables: https://support.google.com/fusiontables/answer/178196?hl=en

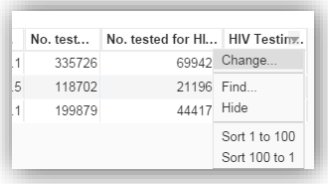
In order to include data from pre-existing indicators in your formula, you must copy the original indicator name exactly as it appears in the dataset and paste it into the formula, wrapped in apostrophes. To do this:

a. Select the indicator you wish to include in your formula from the list on the left. The name of this indicator should now appear in the Right side of the window.
b. Highlight and copy the indicator name listed in the Right side of the window
c. Select the new indicator you just created from the list on the left side of the window
d. Place your cursor in the Formula window on the Right side of the window, type an apostrophe, paste the indicator name, and type another apostrophe (e.g., 'number tested positive for HIV')
e. Add any other characters necessary for your formula such as + / - * or other values
f. Continue these steps until you have written a complete formula.

6. Click 'Save'



7. Your new indicator will now appear in your Google FusionTable dataset. If you see asterisks (‘****’) in the New Indicator column in your dataset, there is an error in your formula. Click on the indicator name and select ‘Change’ to edit the formula.



3. Visualizing data

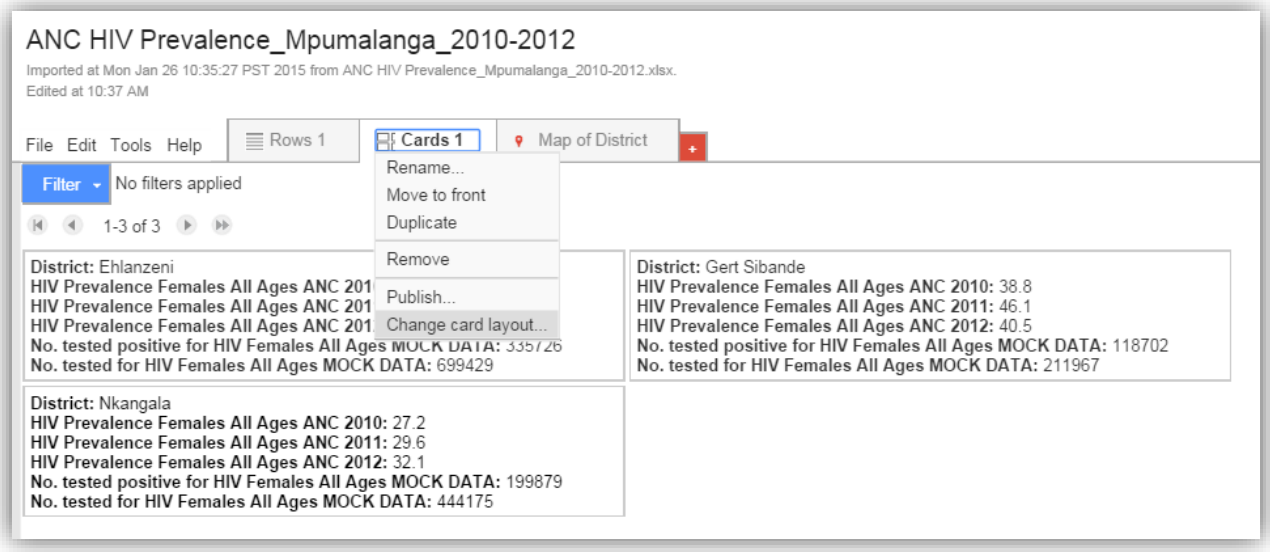
3.1. Cards

Video tutorial: https://www.youtube.com/watch?v=OcxtFbxIsJ4

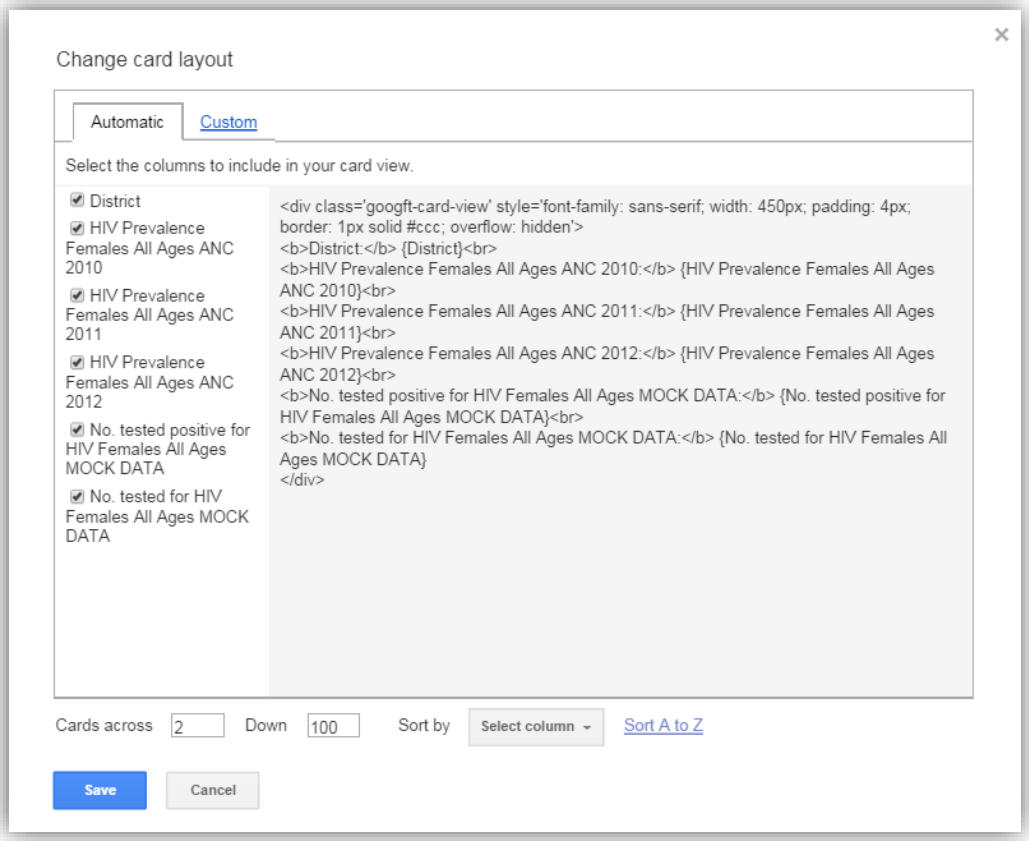
The Cards tab transforms the data in each row of your dataset into line-listed information on a single card. For example, each card shows the district name and related indicators for every row of your dataset. By default, Cards will appear as a tab at the top of your FusionTable.

To change the card layout:

1. Click on the 'Cards' tab
2. Select 'Change card layout'


ANC HIV Prevalence_Mpumalanga_2010-2012
Imported at Mon Jan 26 10:35:27 PST 2015 from ANC HIV Prevalence_Mpumalanga_2010-2012.xlsx.
Edited at 10:37 AM
File Edit Tools Help
Rows 1
Cards 1
Map of District
Filter
No filters applied
1-3 of 3
Rename...
Move to front
Duplicate
Remove
Publish...
Change card layout...
District: Ehlanzeni
HIV Prevalence Females All Ages ANC 201
HIV Prevalence Females All Ages ANC 201
HIV Prevalence Females All Ages ANC 201
No. tested positive for HIV Females All Ages MOCK DATA: 335726
No. tested for HIV Females All Ages MOCK DATA: 699429
District: Gert Sibande
HIV Prevalence Females All Ages ANC 2010: 38.8
HIV Prevalence Females All Ages ANC 2011: 46.1
HIV Prevalence Females All Ages ANC 2012: 40.5
No. tested positive for HIV Females All Ages MOCK DATA: 118702
No. tested for HIV Females All Ages MOCK DATA: 211967
District: Nkangala
HIV Prevalence Females All Ages ANC 2010: 27.2
HIV Prevalence Females All Ages ANC 2011: 29.6
HIV Prevalence Females All Ages ANC 2012: 32.1
No. tested positive for HIV Females All Ages MOCK DATA: 199879
No. tested for HIV Females All Ages MOCK DATA: 444175

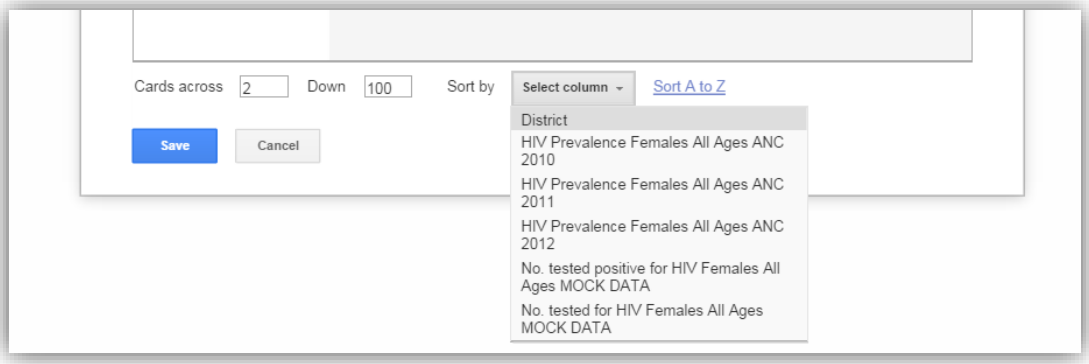
3. Check the boxes on the left next to each indicator you wish to include in your card


Change card layout
Automatic
Custom
Select the columns to include in your card view.
District
HIV Prevalence Females All Ages ANC 2010
HIV Prevalence Females All Ages ANC 2011
HIV Prevalence Females All Ages ANC 2012
No. tested positive for HIV Females All Ages MOCK DATA
No. tested for HIV Females All Ages MOCK DATA

District: {District}
HIV Prevalence Females All Ages ANC 2010: {HIV Prevalence Females All Ages ANC 2010}
HIV Prevalence Females All Ages ANC 2011: {HIV Prevalence Females All Ages ANC 2011}
HIV Prevalence Females All Ages ANC 2012: {HIV Prevalence Females All Ages ANC 2012}
No. tested positive for HIV Females All Ages MOCK DATA: {No. tested positive for HIV Females All Ages MOCK DATA}
No. tested for HIV Females All Ages MOCK DATA: {No. tested for HIV Females All Ages MOCK DATA}

Cards across 2
Down 100
Sort by
Select column
Sort A to Z
Save
Cancel

4. Select Sort by at the bottom of the window and choose the order the cards will be displayed. For example, if you select District, the cards will appear in alphabetical order by District name. If you select an indicator, the cards will appear from smallest to largest value for that indicator.
5. Click 'Save'

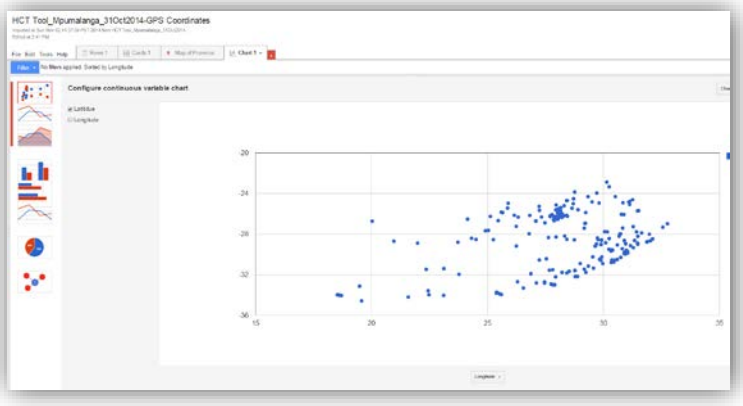

Cards across 2
Down 100
Sort by
Select column
Sort A to Z
Save
Cancel
District
HIV Prevalence Females All Ages ANC 2010
HIV Prevalence Females All Ages ANC 2011
HIV Prevalence Females All Ages ANC 2012
No. tested positive for HIV Females All Ages MOCK DATA
No. tested for HIV Females All Ages MOCK DATA

3.2. Charts

Video tutorial: https://www.youtube.com/watch?v=CcC2DsToAT0

The Chart function summarizes data into a chart format. Start by adding a Chart as a new tab in your FusionTable:

1. Select the red + button ( ) and choose 'Chart' from the drop down menu
2. A new tab 'Chart' containing Chart options will appear



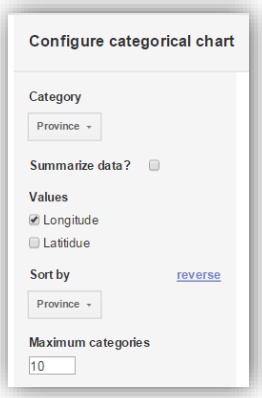
3. Select your preferred Chart Type from the left (e.g. bar chart)

3.2.1. Edit chart appearance

Edit the data and format of your chart using the Configure Categorical chart options on the left side widow:

Category: Change the indicator appearing on the x-axis (horizontal side) of the chart
Values: Check the box next to the indicator(s) you wish to display as values on your chart

Summarize Data: Check the box and select the summary option you wish to display by indicator (minimum values, maximum values, average, etc.)
Sort by: Change the order of elements on the x-axis (*e.g. A=> Z alphabetical, High to low, etc.*)
Maximum categories: Enter the number of categories on the x-axis



4. Edit the appearance of your chart by selecting the Change Appearance in the upper right

Title: Enter the Title of your chart
Legend: Change the location and appearance of your legend
Font/Background: Change the overall chart font and background

Features: Select the detailed appearance of your chart

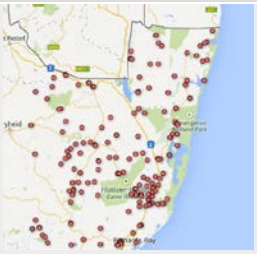
Axis: Select which axis you wish to edit (Horizontal or vertical); edit the title, labels and appearance for that axis

Columns: Select which columns on the chart you wish to edit and edit the color and y-axis location

3.3. Maps

Maps overlay data onto Google Maps. This guide will highlight how to display data on Polygon maps and Point maps. For detailed information about these types of maps see Table 1 below or visit https://support.google.com/fusiontables/answer/174680?hl=en.

Table 1. Comparison of Polygon and Point maps.

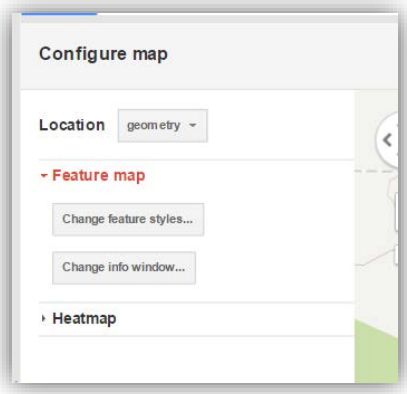
	Polygon Map	Point Map
Definition	Displays shapes that represent areas such as provinces or districts	Displays x,y coordinates that represent specific features such as health facilities
Example outputs		
Program data inputs	Aggregate data (e.g., province or district totals)	Specific location data (e.g., data by facility)
Geographic data inputs	KML mapping file that is merged with program data. See section on *Merging datasets* for instruction.	Longitude and Latitude coordinate data (in decimal degrees) for each location in dataset.

To display data on a map:

1. Select the red + button ( ) and choose Map from the drop down menu
2. A new tab 'Map' will appear that contains a Google map

3.3.1. Edit map appearance

3. Select Change Feature Style under Feature Map on the left side



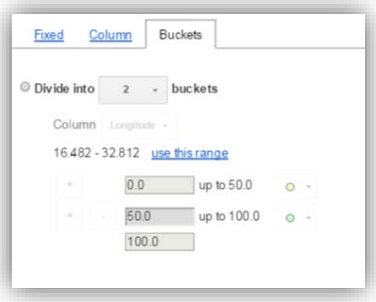
4. **For a Point Map:** Under Points, select 'Marker' icon
   Video tutorial: https://www.youtube.com/watch?v=6iUEJ128P_Q

5. **For a Polygon Map:** Under Polygons, select 'Fill color'
   Video tutorial: https://www.youtube.com/watch?v=wHQSpnVqwD0

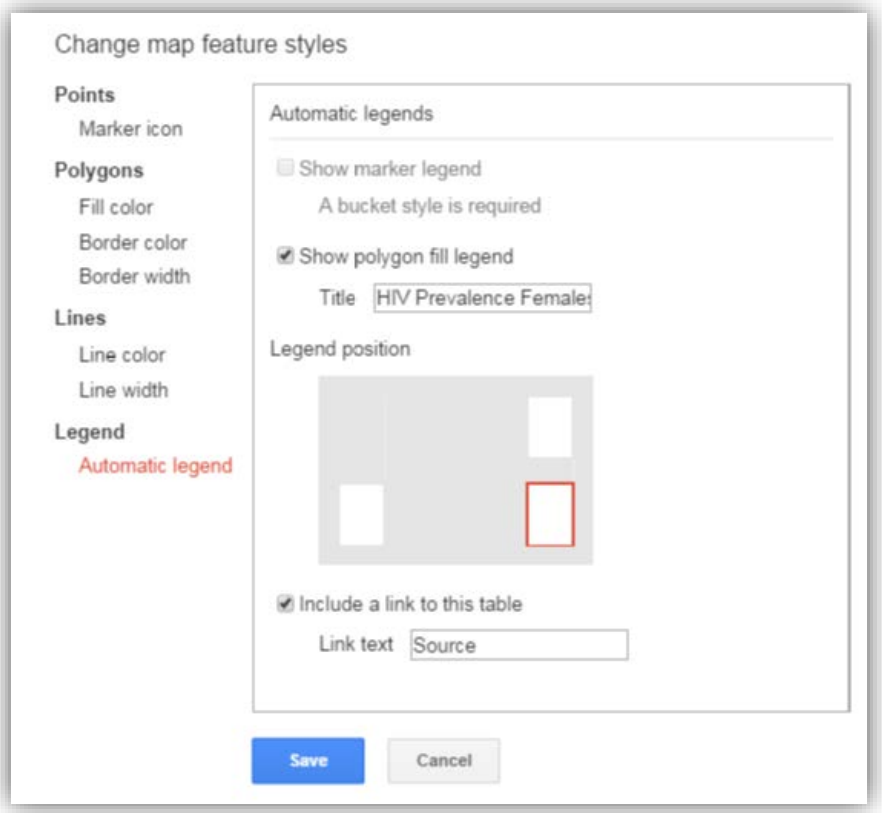
Tip: By default, Maps will display as a point map that pulls location hints from the dataset. See *Merging data in Google Fusion Tables* for instruction on how to display data on a Polygon Map

6. Select 'Buckets.' Buckets are the number of categories (or buckets) you wish your data to be divided into. Edit the following:

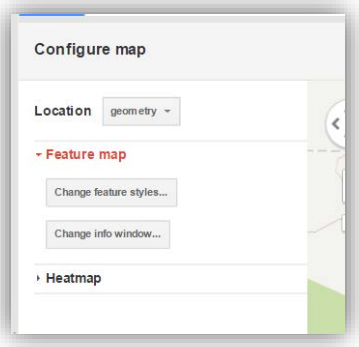
a. **Divide into:** Adjust the number of categories (or buckets) you want your data to be divided into
b. **Column:** Select the indicator to be displayed on the map
c. **Use this range:** Resets the range of the data to match the indicator selected
d. Click on a value to adjust the cutoff point
e. Click on the color and choose from the wheel or shape to change the design of each bucket
f. Select 'Save'



7. Under legend select 'Automatic Legend'
   a. **For a polygon map:** Check the box next to Show polygon fill legend
   b. **For a point map:** Check the box next to Show marker legend
   c. Adjust the title for your legend if needed
   d. Select 'Save'



8. Select Change Info Window under Feature Map on the left side and follow the steps above under 'Cards' for instruction on how to change the info window contents



4. Additional components

4.1. *Merging data in Google Fusion Tables*

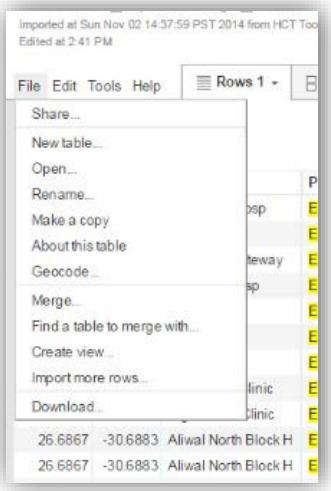
Video tutorial: https://www.youtube.com/watch?v=i6eePmDYf50

Data from different datasets can be merged into a single dataset by linking data that are identical across two or more datasets. Merging data in a KML mapping file to data in a program data set is imperative for displaying district or provincial data on a polygon map. For example, a district-level program dataset can be merged with a District KML file. Note that in order to do this, both datasets must have a column with district names spelled exactly the same.

To do this:

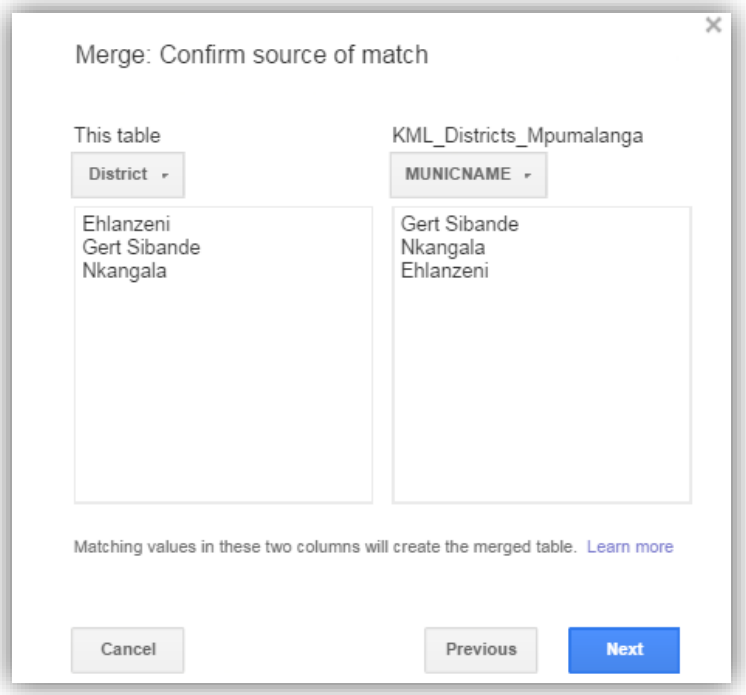
1. Select 'File.'
2. Select 'Merge.'

Tip: All datasets and files to be merged must first be imported into FusionTables, including any KML mapping files. See *Importing data into Google FusionTables* for instruction.

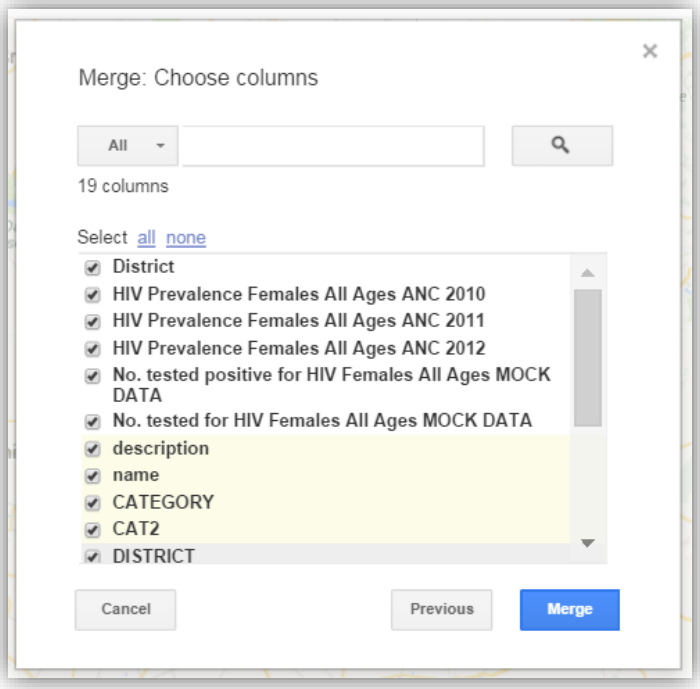


3. Select the FusionTable file you wish to merge
4. Select the indicator in each data file that matches (e.g. the indicator with identical District name data). Select 'Next.'

Tip: The contents of the indicators to be merged must be identical. For example the district name in the data file must exactly match the district name in the KML mapping file. See *Editing a dataset* for instruction on how to change the names of your data files in Google FusionTables. If data is missing in your merged FusionTable (e.g., you only see '****') then the files did not merge properly and will need to be edited.



5. Select which indicators you wish to carry over to your next, merged FusionTable by checking or unchecking the boxes next to that indicator. Select 'Merge.'



Tip: Select functions, including 'Add formula column,' will not work properly after merging unless you download and re-import the merged file. See *Downloading a dataset* for instruction.

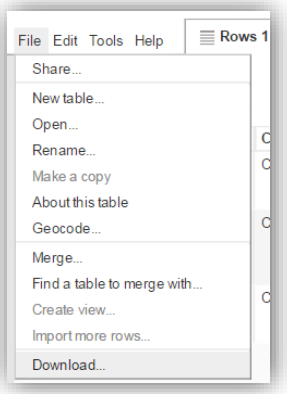
6. Select 'View Table' once the merged table has been created.

4.2. Downloading a dataset

Video tutorial: https://www.youtube.com/watch?v=5FHhJJmsCtg

Formulas cannot be calculated in a merged dataset. Therefore, in order to take advantage of all FusionTable functions, a merged dataset must be downloaded onto your computer as a .csv file and then imported back into Google FusionTables. To download the file:

1. Select 'File' from the menu
2. Select Download



Tip: Files are downloaded to the location specified in your internet browser which is most commonly the *Downloads* folder on your computer. If your file does not appear in the Downloads folder, you can change the download location in Chrome as described here: https://support.google.com/chrome/answer/95574?hl=en

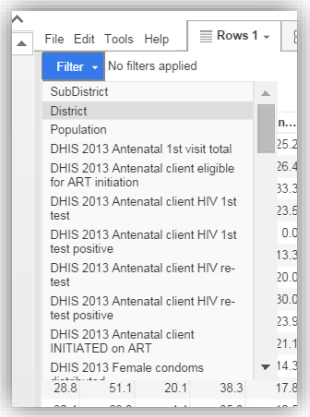
3. Accept the default settings and select 'Download.'
4. Your file is now saved as a .csv in the 'Downloads' folder on your computer.
5. Follow instruction in *Importing data into Google FusionTables* in order to import this .csv file into Google FusionTables for full functionality.

4.3. Filtering data

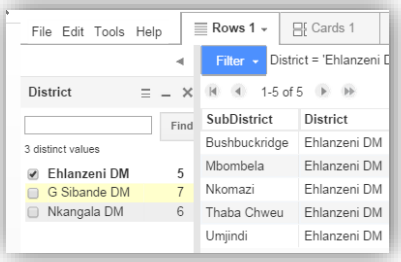
Video tutorial: https://www.youtube.com/watch?v=3jtwB3-rUDs

Google FusionTables allow for certain elements to be included and others to be excluded using the filter function. Elements can be filtered from all tabs (i.e. Dataset, Cards, Charts, and Maps).

1. Click the blue 'Filter' button.
2. Select the category you wish to filter


File Edit Tools Help
Rows 1
Filter
No filters applied
SubDistrict
District
Population
DHIS 2013 Antenatal 1st visit total
DHIS 2013 Antenatal client eligible for ART initiation
DHIS 2013 Antenatal client HIV 1st test
DHIS 2013 Antenatal client HIV 1st test positive
DHIS 2013 Antenatal client HIV re-test
DHIS 2013 Antenatal client HIV re-test positive
DHIS 2013 Antenatal client INITIATED on ART
DHIS 2013 Female condoms
28.8 51.1 20.1 38.3

3. Check the boxes next to the fields you wish to include (e.g. certain provinces or districts)

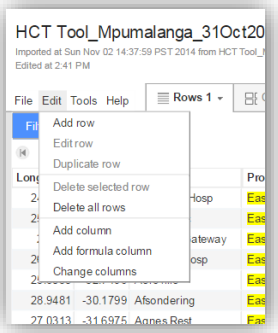


4.4. Editing data

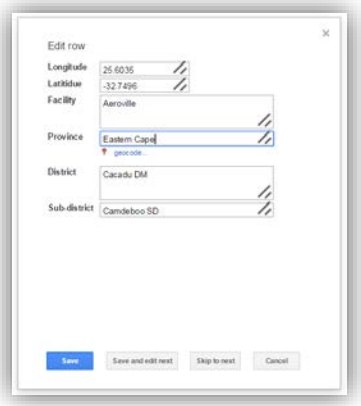
Video tutorial: https://www.youtube.com/watch?v=OWhxQAUdGXk

Select the Tab titled Rows 1 to edit the data in your Google FusionTable.

1. Select the Edit menu to add, delete or change entire rows or columns.



2. Double click within a cell to change the contents of cells within a row.



3. Select 'Save.'

4.5. Opening a saved FusionTable

Video tutorial: https://www.youtube.com/watch?v=GoZEfm7JUVY

Saved FusionTables can be accessed through your Google Drive account. To do this:

1. Visit 'https://drive.google.com or select 'Drive' from your Gmail account
2. Select the FusionTable from your list that you wish to view

4.6. Sharing Google FusionTables

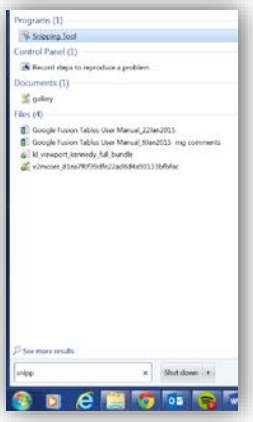
Video tutorial: https://www.youtube.com/watch?v=BdBmm_z3Kac

Outputs can be shared as either static images by taking a screen shot of your final figure or as a digital link through Google that allows users to view and/or edit content.

4.6.1. Sharing a static image

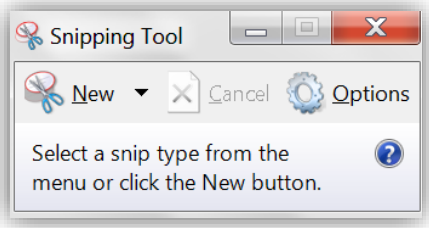
Use the Snipping Tool to capture your desired image

1. From your Start menu, type 'Snipping Tool' and select from the list

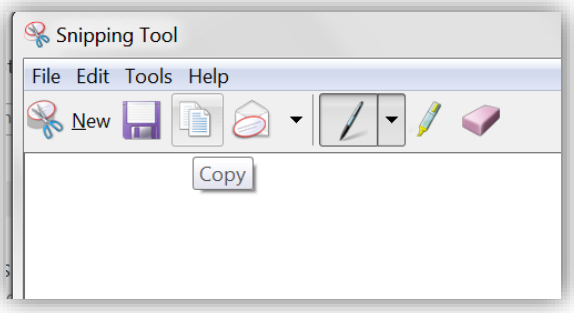


Tip: For further instruction visit: http://windows.microsoft.com/en-us/windows7/products/features/snipping-tool

2. Select ‘New’



3. Use your mouse cursor to draw a rectangle around the area you want to make into an image
4. Select the ‘Copy’ icon



5. Paste the image into any Microsoft Office (e.g. Powerpoint) application

4.6.2. Sharing a digital FusionTable

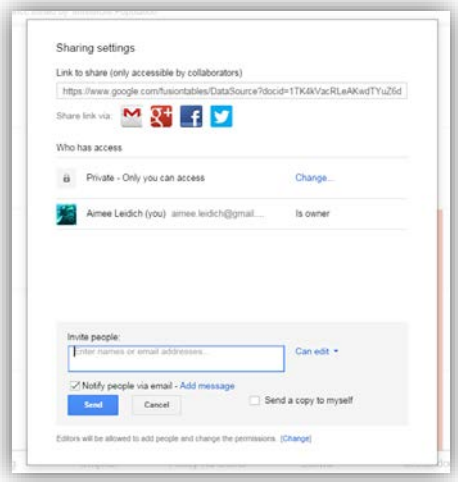
Share a website link containing your FusionTable either by inviting people to view or edit or by sending a URL.

1. 1. Select share

in the upper Right corner

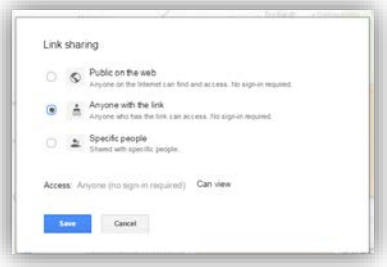
Sharing a link for people to view:

2. Copy the Link to share
3. Paste this link in an email or document to provide access
4. Select 'Change' under who has access



Tip: A link can be viewed by anyone with the link even if they do not have a Google or Gmail account. However, only those with a Google or Gmail account are able to edit a FusionTable

5. Choose 'Anyone with the Link' to allow others with the link to *view* your file. Viewers will not be able to edit or make changes.



Inviting people to edit:

6. Type the Gmail addresses of the people you want to share with under “Invite People”
7. Click the dropdown arrow on the right to designate the type of access:
   - **Can edit**: Allows users to edit and share with others
   - **Can view**: Allows users to view but not make any changes
8. Click **Send**. Invitees will receive an email letting them know you’ve shared the file or folder with them.